UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,001	02/28/2002	Edward Ratner	10006.000710	6285

31894	7590	10/20/2005	EXAMINER	
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ART UNIT	PAPER NUMBER
2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/087,001	RATNER ET AL.
	Examiner	Art Unit	
	Damon Conover	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 February 2002</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 February 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>10/4/02</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1.   Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

It is unclear what the applicant means with the limitation of "at least one characteristic of the image comprises a plurality of characteristics of the image".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-2 and 4-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya et al. (U.S. patent 6,094,508) in view of Bonneau et al. (U.S. patent 6,002,794).

With respect to claim 1, Acharya et al. disclose a method for dynamically determining the threshold value for edge detection of an image based on intensity

change information (abstract). Acharya et al. identify a localization region of the image

(column 3, line 66 – column 4, line 2) and use the mean, minimum, and maximum

intensity values of the region to select a threshold:

threshold $= ((mean-min)/(max-min))^{0.45}$

(column 4, lines 16-23 and column 5, line 15). Once the threshold is determined, edge

detection is performed on the localization region utilizing the threshold value to

determine if each pixel belongs to edge feature of the image (column 5, lines 32 – 37).

This is analogous to removing the pixels from an edge set if they fail to pass the

threshold function.

Acharya et al. do not include a step for classifying the pixels as edge chains.

Instead all calculations are done directly on the localization regions.

Bonneau et al. disclose a technique for encoding and decoding color digital

images which does include a step for chain coding regions of the image to identify

outside edges of objects (column 18, lines 41 – 43). This step is analogous to identifying

candidate edge chains.

It would have been obvious to one of ordinary skill in the art at the time of the

invention to include in the edge detection method of Acharya et al., the chain coding

step as taught by Bonneau et al. in order to help identify an object in the image

(Bonneau et al., column 18, lines 63-65).

With respect to claim 2, Acharya et al. define the localization region as a

percentage of the total captured image size and may be large or small (column 4, lines

2- 7). Intensity is a global characteristic of the localization region, and Acharya et al. allows for the localization region to be 100 percent of the captured image size.

With respect to claim 4, as discussed above, Acharya et al. disclose a method for dynamically determining the threshold value for edge detection of an image based on intensity change information, where intensity is a global characteristic of the localization region.

Acharya et al. further disclose in the background of the invention that an edge of an image may be defined by its intensity and/or color change (color variation) between pixels (column 1, lines 14-16), but Acharya et al. does not disclose steps for executing the method for a color image.

Bonneau et al. disclose a technique for producing an encoded image separated by color components (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the intensity value calculations of Acharya et al., the technique for decomposing color images into intensity values for each color component (red, blue, and green) (Bonneau et al., column 4, lines 6-9) in order to capture the edges that are undetected when color information is not considered.

With respect to claim 5 and 6, as discussed above, Acharya et al. disclose a method for dynamically determining the threshold value for edge detection of an image based on intensity change information, and that mean intensity change information is used to select a threshold.

As discussed above, Acharya further disclose in the background of the invention that an edge of an image may be defined by its intensity and/or color change (color variation) between pixels, but Acharya et al. do not disclose steps for executing the method for a color image.

As discussed above, Bonneau et al. disclose a technique for producing an encoded image separated by color components.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the method for selecting a threshold using mean intensity change information of Acharya et al., the technique for decomposing color images into intensity values for each color component. It would also have been obvious for an embodiment to use the median measure of color variation in place if the mean measure of color variation, as a design choice. The discussion is the same as addressed for claim 4.

With respect to claim 7, as discussed above, Acharya et al. disclose a method for dynamically determining the threshold value for edge detection of an image based on intensity change information, where intensity is a global characteristic of the localization region.

Acharya et al. do not include a step for classifying the pixels as edge chains. Instead all calculations are done directly on the localization regions.

As discussed above, Bonneau et al. disclose a technique for encoding and decoding color digital images which does include a step for chain coding regions of the image to identify outside edges of objects.

It would have been obvious to one of ordinary skill in the art at the time of the

invention to include in the edge detection method of Acharya et al., the chain coding

step as taught by Bonneau et al. The discussion is the same as addressed for claim 1.

With respect to claim 8, Acharya et al. select a threshold that is a linear function

of the mean, minimum, and maximum intensity values of the image (column 4, lines 16-

23):

threshold $= ((\text{mean-min})/(\text{max-min}))^{0.45}$

(column 5, line 15).

With respect to claims 9-10 and 15, the "apparatus for image processing"

corresponds to the "method for image processing" of claims 1-2 and 8. The discussion

is the same as addressed above.

With respect to claim 11-14, the "apparatus for image processing" corresponds

to the "method for image processing" of claims 4-7. The discussion is the same as

addressed above.

With respect to claim 16, Bonneau et al. disclose a method for processing color

digital image data by encoding the data to gain high compression while retaining

important edge information (column 3, lines 65-67).

With respect to claim 17, Bonneau et al. describe wherein the video encoding

method operates cooperatively with a video decoder, and wherein the video decoding

method also comprises the edge identifier, the means for determining, and the

thresholder (column 16, lines 38-42).

With respect to claim 18, Bonneau et al. disclose a method for decoding

compressed image information which has been encoded (column 3, line 67 – column 4,

line 1).

With respect to claim 19, as discussed above, Acharya et al. disclose a method

for dynamically determining the threshold value for edge detection of an image based

on intensity change information, where intensity is a global characteristic of the

localization region.

Acharya et al. do not include a step for classifying the pixels as edge chains.

Instead all calculations are done directly on the localization regions.

As discussed above, Bonneau et al. do include a step for chain coding regions of

the image to identify outside edges of objects.

It would have been obvious to one of ordinary skill in the art at the time of the

invention to include in the edge detection method of Acharya et al., the chain coding

step as taught by Bonneau et al. The discussion is the same as addressed for claim 1.

With respect to claim 20, as discussed above, Acharya et al. disclose a method

for dynamically determining the threshold value for edge detection of an image based

on intensity change information.

Acharya et al. do not include an encoder, a decoder, or a step for classifying the

pixels as edge chains.

As discussed above, Bonneau et al. disclose a technique for encoding and

decoding color digital images which does include a step for chain coding regions of the

image to identify outside edges of objects.

It would have been obvious to one of ordinary skill in the art at the time of

the invention to include in the edge detection method of Acharya et al., the

encoding/decoding technique as taught by Bonneau et al. in order to provide

compression for a color image while preserving its edge features (Bonneau et al.,

column 2, lines 11-16).

Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure:

Lin et al. ("Color Image Segmentation Using Modified HSI System for Road

Following". Lin, Xueyin and Shaoyun Chen. Proceedings of the 1991 IEEE Inernational

Conference on Robotics and Automation. April 1991.) disclose an automatic adaptive

threshold selection method used in color image segmentation (abstract).

Koschan ("A Comparative Study on Color Edge Detection". Koschan, Andreaas.

Proceedings 2nd Asian Conference on Computer Vision ACCV'95. December 1995.

Volume III. Pages 574-578.) discloses an edge detection technique for color images

that included a edge point determination step which calculates the mean of the color

change for the three color channels.

Ebrahimi (U.S. patent 5,835,237) discloses an apparatus comprised of a video

encoder (as clearly illustrated in figure 1, and refer to column 5, lines 51-57), wherein

the video encoder is configured to operate cooperatively with a video decoder, and

wherein the video decoder also comprises the edge identifier, the means for

determining, and the thresholder (as clearly illustrated in figures 1-2 and 8, and refer for the discussion of figure 8 to column 8, lines 9-32).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Damon Conover whose telephone number is (571) 272-5448. The examiner can normally be reached Monday – Friday, 8:00 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached at (571) 272-7429. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JINGGE WU
PRIMARY EXAMINER